



**INTERPRETATIONS & APPLICATIONS
OF BUILDING CODES & REGULATIONS #97-2**

CODE SECTION : IRC, IBC 2308

02/06/96 rev. 9/16/03

SUBJECT : LATERAL ANALYSIS/DESIGN OF SINGLE-FAMILY RESIDENCES

According to Arizona Revised Statutes 32-144 (A)-3 residential structures are exempt from the State Board of Technical Registration Rules. Because of this rule, design by a professional is not required for single family residences in Arizona.

A lateral analysis is not required in residential construction which conforms to the International Residential Code, or the conventional construction requirements of the International Building Code (Section 2308). Some residences may require only partial calculation to check for lateral stability.

When the Building Official is not satisfied that a residential structure has been adequately designed to resist lateral or vertical loads, he may require substantiation from a design professional.

The design professional shall verify that the lateral load resisting elements are adequate for both vertical and lateral loads. It may be possible for the design professional to evaluate and determine what is required for the lateral stability of a residence without numerous detailed calculations. The design professional, however, shall provide a "Statement of Lateral Stability" which includes clear and concise documentation indicating how lateral stability is achieved in a given residential structure or portion of the structure. Included shall be a description of the load path and the shear resisting elements considered by the design professional in determination of the lateral stability.

Regardless of the extent of the calculations, the plans must show sufficient detailing to ensure that the load path and the shear resisting elements act as assumed in the "Statement of Lateral Stability." This detailing should include the horizontal diaphragm construction and chord ties, blocking above shear walls, shear walls with hold downs (if required) and connections.

If the design professional or the Building Official determines a formal lateral analysis is required, the analysis shall include the information indicating that requirements of IBC Chapter 16, have been met, including the following:

1. **DESIGN LOADING:** Design loading including the code criteria, wind speed and exposure, and seismic zone. Application and magnitude of the loads are to be as determined by the design professional.
2. **HORIZONTAL DIAPHRAGM CALCULATIONS:** Calculations shall be performed to the extent determined by the design professional to provide adequate detailing for the lateral resisting systems. Shear stresses and chord forces for major diaphragms should be calculated. Horizontal diaphragms and chords shall be shown on the construction drawings.
3. **LOAD SUMMARY:** A load summary at each level shall be provided. The total shear at each level should be shown and the total length of walls used to resist this load should be indicated.
4. **SHEAR WALL AND OVERTURNING:** The shear and overturning shall be considered for each shear wall.
5. **REVIEW AND SEAL DRAWINGS:** The design professional shall review and seal the drawings as required by the State Board of Technical Registration.